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RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #15

Ground Vehicle and Fixed Obstruction Transmission Period

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SUMMARY

Non-Transponder-Based transmitters are required to transmit with a period of 5 seconds (low rate) while they are stationary in the On-Ground sate. However, the MASPS calls for update periods on the order of 1.5 seconds for surface applications. There is no way to achieve 1.5 second update periods with 5 second transmission periods.

The high and low rates are designed to conserve spectrum. There could be large numbers of stationary aircraft on an airport surface simultaneously. However, there should never be large numbers of stationary ground vehicles or on the movement area simultaneously, so the impact of a shorter transmission period on spectrum congestion is minimal. Similarly, there should never be large numbers of fixed obstructions simultaneously on the airport surface. Therefore, the slow transmission rate for ADS-B equipped ground vehicles and fixed obstructions should be eliminated. ADS-B equipped ground vehicles and fixed obstructions should transmit position information at the high rate, twice per second, any time they are transmitting.

A specific requirements change is proposed in the text of this Working Paper.

Specific recommendation for requirement change in DO-260A

The following text is proposed to replace section 2.2.3.3.2.3 of DO-260A

2.2.3.3.2.3 ADS-B Surface Position Message Broadcast Rate

2.2.3.3.2.3.1 Class B1 Transmission Devices

a. Once started, ADS-B Surface Position Messages shall be broadcast by ~~the~~ class B1 transmission devices when in the On-Ground state using either the "High" or "Low" rate which has been selected as follows:

(1). Switching from "High" rate to "Low" Rate:

(a). The broadcast rate shall be changed from "High" to "Low" when the navigation source position data has not changed more than 10 meters in a 30 second sampling interval.

Note: *It is acceptable to compute the 10 meter distance using either rectangular or polar coordinates.*

(b). Upon selecting the "Low" rate, the class B1 transmission device shall save the Position data at the time that the "Low" rate was selected.

(2). Switching from "Low" rate to "High" Rate:

The broadcast rate shall be changed from "Low" to "High" when the position of the class B1 transmission device has changed by 10 meters or more since the "Low" rate was selected.

Note: *It is acceptable to compute the 10 meter distance using either rectangular or polar coordinates.*

b. If the "High" rate is selected, then the Surface Position Message shall be transmitted at random intervals that are uniformly distributed over the range of 0.4 to 0.6 seconds relative to the previous Surface Position Message.

c. If the "Low" rate is selected, then the Surface Position Messages shall be transmitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds relative to the previous Surface Position Message.

~~***Note:*** *Pending further study and analysis of surface broadcast rates and their triggering mechanisms by regulatory authorities, it is widely assumed that the "Low" rate will be raised to a nominal rate approaching once per second.*~~

d. In the event that the transmission device cannot determine the required transmission rate, then the "High" rate shall be used as the default transmission rate.

e. Exceptions to these transmission rate requirements are defined in subparagraph 2.2.3.3.2.9.

2.2.3.3.2.3.2 Class B2 and B3 Transmission Devices

a. Once started, ADS-B Surface Position Messages shall be broadcast by class B2 or B3 transmission devices at random intervals that are uniformly distributed over the range of 0.4 to 0.6 seconds relative to the previous Surface Position Message.

b. Exceptions to this transmission rate requirement are defined in subparagraph 2.2.3.3.2.9.